EXPERIMENT AND NON-EXPERIMENTAL SCOPE OF WORK FORM, ANLHEP_644

Date of Submission 05/06/08 ☒ New ☐ Renewal ☐ Supplemental Change

Division:	HEP	**Dept./Section:**	Neutrino	**Div. Ref. #:**	53207-00-137
Project Title:	**Double Chooz (Main Calibration System)**				
Location (Building/Room, etc.)		exp. work bldg. 366, office F-137, extension 2-3648			
Project dates:	**Start:**	05/06/08	**End:**	12/31/08	
Designated Project Manager:		**Reichenbacher, Juergen**			

The Project Manager / Principle Investigator must be familiar with the responsibilities and the requirements of the experiment safety review in the *ESH Manual,* Section 21.2.

Work may not be performed until procedures have been approved, and authorization is granted. This completed form, hazard analysis and all supporting documentation must be submitted to the division ES&H Coordinator. Appropriate personnel for ES&H issues associated with the proposed work will review the information. The Project Manager must resolve outstanding issues before the work begins; no work may begin until Approval and Authorization is granted.

Project Manager Approval — **Date** May 6, 2008

Review Approval — **Date** 6/1/2008

ES&H Authorization — **Date** 6/2/2008

Division Authorization — **Date**

SCOPE OF WORK (ISM STEP 1)

General Description

Provide an overview description of the experiment (or non-experimental work project). Describe specific equipment for tasks within the project, concentrate on operations that focus on the work, and summarize the hazards that you expect to encounter. Attach designs, drawings, or other useful descriptive material.

Main Calibration System for the Double Chooz Experiment

Tests with the calibration deployment system along the vertical axis of the chimney mock-up are performed in order to determine the mechanical precision and speed of deployment, as well as other tests in order to fully explore the features of the Double Chooz automated calibration system.

HAZARD ANALYSIS (ISM STEP 2)

Hazard List

Examples include but are not limited to the examples below. You may expand your comments on hazard analysis in the scope of work (ISM STEP 1) section of this document.

Low Risk

- ☐ Delivery of items such as furniture, office supplies
- ☐ Equipment (bench top set up) utilizing hand tools and that does not fall into another hazard classification
- ☐ Equipment repair, de-energized, utilizing hand tools, and that does not fall into another hazard classification
- ☐ Equipment calibration, de-energized, utilizing hand tools, and that does not fall into another hazard classification
- ☐ Computer set-up
- ☐ Installation of window blinds that requires no power tools or use of a ladder
- ☐ Performing office-type tasks
- ☐ Assembly of technical components with use of hand tools and no exposure to additional hazards of a greater risk

Moderate Risk

- ☐ Installation of furniture utilizing power tools, battery operated tools or hand tools
- ☐ Installation of office partitions. including repair and modification to existing partitions, shelving involving no hard wiring of electrical connections, plug type only
- ☐ Installations of carpet with or without utilizing consumer quantity of adhesive product
- ☐ Low voltage calibration/testing. Below 50 volts
- ☐ Repair and/or window glass replacement, window cleaning below 6 ft.
- ☐ Repairs that do not require lockout/tagout or use of chemicals that are above a consumer commodity quantity
- ☐ Kitchen appliance repair with out any additional exposure to a high risk activity
- ☐ Activity that does not involve working with any type of energy source, working above 6 ft., or entry into a confined space
- ☐ Painting with latex paint
- ☐ Site survey work that is not within 6 feet of a roadway and does not include the use of lasers higher than class 2

☐ Tree and flower planting in pots or planters

☐ Use of class 2 lasers

☐ Assembly of technical components utilizing power tools, battery operated tools, or hand tools

☐ Assembly of purchased component utilizing power tools, battery operated tools, or hand tools

☐ Service of experimental mechanical devices utilizing power tools, battery operated tools, or hand tools

☐ Installation of wire cages utilizing power tools, battery operated tools, or hand tools

High Risk

☐ Electrical or other energy sources requiring lockout/tagout for any installation or modification

☐ Working with or having an exposure to hazardous materials (e.g., toxins, carcinogens, asbestos, lead, beryllium, etc.)

☐ Excavations of any type or depth that requires a Dig Permit

☐ Confined spaces

☐ Noise levels above 85 dB

☐ Ionizing radiation (per entry posting)

☐ Non-ionizing radiation (per entry posting)

☐ Working on energized equipment of greater than 50 volts

☐ Installation of office partitions containing electrical hard wire electrical connections

☐ Activity requiring lockout/tagout of energy source

☐ Work on transformer

☑ Working with the potential for a fall from a height greater than 6 ft

☐ Pole work of any nature

☐ Communication tower work including erecting, painting, or inspection

☐ Elevator repair/maintenance/inspection

☐ Overhead crane inspections or repair

☐ Equipment alignment of energized equipment

☐ Sprinkler repairs or modifications

☐ Utility line work on gas line, electrical, water, steam, air, or communication

☐ Mechanical work that may include welding, cutting, burning, or any open flame work, metal grinding, or saw cutting

☐ Concrete boring/cutting/grinding/jack hammering

☐ Hoisting, rigging, or lifting

☐ Parking lot paving and striping

☐ Tree and stump removal, grass burning, or chemical treatments

☐ Laser repair and installation

☐ Painting with epoxy paint

☐ Chiller or refrigerant repair/recovery or replacement

☐ Chemical use (use of flammable products, asbestos abatement, work on lead painted surfaces)

☑ Potential releases to environmental media (air, land, surface water, and/or groundwater)

☐ Equipment use (cranes, fork lift, scissor lift, boom lift, scaffolds, back hoes, bobcats)

☐ Other high risk situations as determined by line management or the division ES&H coordinator

Yes No

○ ◉ **Is this job performed in a location or environment having a special designation where specific precautions are to be observed?**

Examples (Check those applicable)

☐ Nuclear facility

☐ Nonnuclear radiological facility

☐ Radiological controlled area

☐ Outdoor-NEPA review

☐ Indoor-laboratory, service area, common area

☐ Floor loading limitations

☐ Noise posted area

☐ Laser controlled area

☐ Biohazard area

☐ Magnetic field

☐ Ultraviolet (UV)

☐ Microware

☐ High heat/cryogenics

☐ Hazardous/flammable/reactive chemicals

☐ Energized systems.electrical, pressure

☐ Confined space

☐ Elevated 6 feet or more above working level

☐ Asbestos, lead, mercury, beryllium in area or could be disturbed

☐ Clean room

☐ Other specifically defined locations or environments?

Yes No

○ ◉ **Is this job a complex activity?**

Examples (Check those applicable)

☐ More than one work group necessary to complete the job.

☐ Steps of a task or tasks of a job must be completed in an exact sequence.

☐ Shutdowns of various systems and lockout/tagouts of various energy sources must be completed.

☐ Life safety features/egress routes altered.

☐ Additional specific training/skills/knowledge/fitness required for those performing task.

☐ Materials handling issues - heavy, bulky, hazardous materials handled individually, with manually operated equipment with powered equipment such as forklifts, cranes, etc.

☐ Other specific complex activities? You may expand your comments in the scope of work (ISM STEP 1) section of this document.

HAZARD CONTROLS (ISM STEP 3)

ENGINEERING CONTROLS

Describe the engineering controls applied to control the hazards. Engineering controls include enclosures and barriers that cannot be removed without the use of tools, interlocks, ventilation, software controls, etc.

Task	Engineering Controls
Mount automation system on designated platform on top of the chimney.	Local work area will be closed for passing of non-essential other humans using appropriate ribbon band. ES&H compliant ladder with safe working platform on top will then be moved next to the chimney mock-up and

	precisely positioned. Next the stepper motor assembly will be carried up the stairs, aligned and fixed on the two sockets which were pre-mounted on top of a custom-built operation platform, which is permanently attached to the rear of the chimney top level. The stepper motor assembly can safely remain mounted on the designated operation platform.
Operate automation system on top of the chimney	The tests with the calibration deployment system along the vertical axis of the chimney are performed in order to determine the mechanical precision and speed of deployment, as well as other tests in order to fully explore the features of the Double Chooz calibration system. A Laptop has to be temporarily carried up the ladder for system control.
Deploy through oil cylinder	The acrylics cylinder, which is positioned under the chimney and filled with white mineral oil, is placed in a sufficiently large plastic container at all times. In the case of a leak in the cylinder the entire leakage oil is still safely contained.

ADMINISTRATIVE CONTROLS

List all work procedures, permits and checklists necessary to mitigate hazards. The Project Manager must describe where skill of the researcher/craft/work is being relied upon for hazard mitigation and control.

Task	Administrative Controls
Mounting/Dismounting of automation system on designated platform on top of the chimney.	Disconnect exchangeable spool including the wire-weight interface from z-axis system. Disconnect all cables of automation system. Mount/dismount boom of the z-axis system and carry it separately up/down the ladder. Insert/Remove safety pins that secure z-axis system and carry it up/down the ladder.
Filling of cylinder with oil	First, perform a one day pressure test with water, before filling cylinder with oil. Every filling procedure has to be done gradually and slowly, in order to minimize stresses on the glue joint at the bottom of the cylinder. Once filled cylinder must not be moved.

PERSONAL PROTECTIVE EQUIPMENT

Specify personal protective equipment (PPE) to be worn. For gloves, be specific as to the type appropriate for the task and which steps in the activity the PPE is required.

Task	PPE

WORKING WITHIN CONTROLS (ISM STEP 4)

All work must be performed within the controls for all the identified hazards.

It is the Project Manager responsibility to verify that this document is kept up to date and determine if changes are significant enough to require a new review/document.

FEEDBACK (ISM STEP 5)

Identify types of records and the reporting method that is useful for improvement on the tasks within this project. This could include lab notebooks, datasheets, computer data, instrument logs, images, etc.

Task/Situation	Record
Emergency	Call 911, take appropriate immediate action (e.g., evacuate space) notify supervisor, building manager, division management, ESH coordinator

Was a graded approach applied in describing the scope of work? As an example, for work or experiments involving a few hazards of low severity did a knowledgeable colleague who will neither supervise nor perform the experiment examine the setup then document his or her conclusions in accordance with ISM implementation as appropriate for division work approval/authorization ? ☒ Yes ☐ No

If yes, describe the graded approach taken.

Local work area will be closed for passing of non-essential other humans using appropriate ribbon band. ES&H compliant ladder with safe working platform on top will then be moved next to the chimney mock-up and precisely positioned. Next the stepper motor assembly will be carried up the stairs, aligned and fixed on the two sockets which were pre-mounted on top of a custom-built operation platform, which is permanently attached to the rear of the chimney top level. The following safety steps have to be pursued for mounting/dismounting of the automation system on the designated platform on top of the chimney: Disconnect all cables of automation system. Mount/dismount boom of the z-axis system and carry it separately up/down the ladder. Insert/Remove safety pins that secure z-axis system and carry it up/down the ladder.
The stepper motor assembly can safely remain mounted on the designated operation platform.
The tests with the calibration deployment system along the vertical axis of the chimney are performed in order to determine the mechanical precision and speed of deployment, as well as other tests in order to fully explore the features of the Double Chooz calibration system.
A Laptop has to be temporarily carried up the ladder for system control. It cannot permanently remain there unless especially secured to the working platform on the ladder.
The acrylics cylinder, which is positioned under the chimney and filled with white mineral oil, is placed in a sufficiently large plastic container at all times. In the case of a leak in the cylinder the entire leakage oil is still safely contained. The following safety steps have to be pursued for filling of the cylinder with oil: First, perform a one day pressure test with water, before filling cylinder with oil. Every filling procedure has to be done gradually and slowly, in order to minimize stresses on the glue joint at the bottom of the cylinder. During pressure tests and all fillings cylinder has to remain in the designated and sufficiently large plastic container. Once filled cylinder must not be moved.

I received a copy of the

<u>Double Chooz (Main Calibration System)</u> scope of work, hazard analysis, and required controls for hazards.

I understand the information provided.

Date	Badge #	Printed Name	Signature
14 July 2008	34640	Goodman, Maury	
		Wood, Ken	
		Skrzecz, Frank	